A

THERMOMETRICAL TABLE

ON THE SCALES OF

Fahrenheit, Centigrade, & Reaumur;

COMPRISING THE MOST REMARKABLE PHENOMENA CONNECTED WITH TEMPERATURE, IN RELATION TO

CLIMATOLOGY, PHYSICAL GEOGRAPHY, CHEMISTRY, AND PHYSIOLOGY.

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THERMOMETRICAL TABLE, &c.

THE accompanying Thermometrical Table has been copied from a thermometer in my possession, graduated on the scales of Fahrenheit and Celsius. It has been designed to obviate the necessity for those perplexing calculations, so often rendered necessary by the use of different methods of graduation in England and on the Continent. In most chemical works, we find, besides the rules given for the conversion of the degrees of one scale into those of another, comparative tables, which, however, convey no information beyond the bare fact of the correspondence of certain degrees. In this table, the attempt has been made to make it convey information on numerous interesting points, connected with temperature in relation to Climatology, Physical Geography, Chemistry and Physiology.

There is another advantage which a table of this kind must possess over those hitherto published in works on Chemistry. In the latter, the degrees on one scale only, run in arithmetical progression,

while the corresponding degrees on the other scale, are necessarily given in fractional or decimal parts, and at unequal intervals. Thus, in some of the best works on Chemistry, a comparative table is printed, which is only fitted for the conversion of the Centigrade into Fahrenheit degrees, so that a person wishing to convert the Fahrenheit into Centigrade degrees, would have to revert to one of the old formulæ of conversion. This process must also be adopted whenever the Centigrade degrees are given in decimal parts, for all the tables yet published in English works, wrongly assume that the Centigrade degrees are always given in whole numbers. The present table renders such calculations unnecessary, since the value of any degree, or of any part of a degree on one scale, is immediately found on the other, by looking at the degree in a parallel line with it. The main divisions will, I believe, be found perfectly accurate:—in single degrees a little inequality may be occasionally detected; but I have not found the error to be such as to affect the calculated temperatures. When it is considered that the table has been drawn on stone, and that those artists who are best qualified for the execution of such an arduous work are not always aware of the exact principles intended to be developed, it may be regarded, perhaps, as a matter of surprise, that so great a degree of accuracy has been attained.

Although the Fahrenheit and Centigrade scales are the two which are chiefly used in Europe, it has been thought advisable to carry out the parallel degrees of Réaumur's scale, by dots on the drawing of the tube. This table, therefore, comprises in itself, six distinct tables, assuming the necessity for each scale to be represented in whole degrees,—with the additional advantages: 1st, that the space occupied is smaller, and 2nd, the value of any fractional part of a degree on one, may be at once determined on the other two scales.

It is extraordinary, considering the great advances which have been recently made in physical science, and in the manufacture of philosophical instruments, that the makers of thermometers should still adhere to the old and absurd practice of marking on the Fahrenheit scale, the unmeaning words *Temperate, Summer-heat, Blood-heat, Fever-heat, Spirits boil, &c.*, when the instrument might be easily made to convey a large amount of information, in respect to climate, as it is dependent on temperature. Thus the mean temperatures of England, Ireland, and Scotland, with the maxima and minima, as well as the mean range of the thermometer throughout the year, might easily find a place on all the common scales. When the length of the scale would admit of such an arrangement, the mean temperatures of the principal cities and towns of Great Britain as

well as of foreign climates, might be attached, with many interesting points in animal and vegetable physiology. The extensive tables on temperature, collected and arranged by Sir James Clark, in his excellent treatise on Climate, would here serve as a useful guide.

It will be seen that the table now for the first time published, ranges from 12° to 374° Fahrenheit, from—11° to + 190° Centigrade, and from —9° to + 152° Réaumur. It might have been extended, but this, it was considered, would have rendered it of very inconvenient size: and besides, the range here selected comprises all the most remarkable phenomena connected with heat. The more important facts relating to temperature above and below this range, will be found inserted in distinct paragraphs, on the table, with formulæ for the conversion of the degrees of Centigrade into those of Fahrenheit and *vice versâ*.

It will be only necessary to state generally those facts which the table is intended to illustrate. They will be found arranged opposite to their respective degrees, either on the Centigrade or Fahrenheit side, according to the space afforded. Some points have been necessarily omitted, in order not to render the table confused.

Thus it has been impossible to introduce all the maxima and minima of temperature in respect to

climate, owing to the spaces being already occupied, but a selection has been made of some of the most important of these. The facts connected with temperature, placed on the scale, may be arranged under the heads of Climatology, Physical Geography, Chemistry and Physiology.

Climatology.

1. The *mean temperatures* of the principal countries, towns, and cities in the world, with the maxima and minima, as well as the mean summer and winter temperature of some of the most important localities.
2. The *maximum* degrees of *heat*, and the *minimum* degrees of *cold*, observed on the surface of the globe, including the accumulated temperatures of air, at Edinburgh and Geneva.

Physical Geography.

1. The *temperature of the atmosphere*, as observed on the summits of the principal mountains of the Old and New World, with the respective elevations attached—at the sea level in various latitudes, from the Arctic to the Antarctic seas, as well as in deep mines and other excavations in Europe and America.
2. The *temperature of the ocean* at the surface, and at various depths to 12,420 feet, including the

temperature of the Polar Seas, of the Mediterranean, Atlantic and Pacific, with the temperature of the Gulf stream.

3. The *temperature* of the waters of *lakes* and *rivers* at various depths, with the respective fathomings attached.
4. The *temperature of the strata of the Earth* at various depths, observed in some of the deepest mines in the Old and New World.
5. The *temperature* of water raised in *Artesian wells* in Europe, from depths varying from 250 to 1794 feet.
6. The *temperature* of the principal *Thermal springs and baths* observed in Europe, Africa, the West Indies and South America.
7. The *temperature* at which *water boils* at all the elevated and inhabited spots in the world, including the summits of the mountains of Switzerland, South America, and Central Asia; the boiling point for all elevations up to 5415 feet, and for 1054 feet depression below the level of the sea.

Chemistry.

1. The evaporating, boiling, fusing, melting, subliming and congealing points of all solids and liquids in chemistry, from 12° to 374° F., from —11° to + 190° C. and from—9 to + 152° R., including the boiling points of the saturated

solutions of numerous salts, and the melting points of a large number of alloys.

2. The temperature for fermentation of various kinds, malting, putrefaction, etherification, and other chemical processes.
3. The boiling points of alcohol and acids of various specific gravities, with the respective densities of the vapours.
4. The pressure or elastic force of the vapour of water, alcohol, oil of turpentine, and ether, at various temperatures.
5. The temperatures, with the corresponding pressures required for the liquefaction of the gases.
6. The temperature for the explosion and ignition of fulminating and combustible substances.

Physiology.

1. The maximum degrees of natural and artificial heat, and minimum degrees of cold, borne by man and animals.
2. The temperature of the body in Man, Mammalia, Birds, Reptiles, Fishes, and Insects.
3. The temperature at which hybernation takes place in certain animals.
4. The temperature for the germination of seeds, incubation, the artificial hatching of the ova of birds, fishes and insects.
5. The temperature for the growth of the Sugar

Cane, Date, Indigo, Cotton-tree, and for the cultivation of the Vine.

6. The temperature for warm, tepid and vapour baths; the vapour baths of Russia and Finland.

As the value of a table of this kind, depends less on the compiler than on the observers on whom he relies, I feel bound to state that I am chiefly indebted to the following authorities :—for Climatology and Physical Geography; to Humboldt, Bonpland, Saussure, Boussingault, Rose, Ermann, Baer, Von Wrangell, Breislak, Phipps, Scoresby, Franklin, Parry, Back, Ross, Pachtusoff, Zivolka, Cordier, Gay Lussac, Pouillet, Biot, Arago, Bertrand, Desfontaines, Gerard, Lhotsky, Schomburgk, Davidson, Forbes, Brewster, D'Abbadie, Moore and Beke;—for Chemistry and Physiology; to Berzelius, Dumas, Mitscherlich, Gaultier de Claubry, Peligot, Davy, Faraday, Ure, Brande, Graham, Turner, Dr. Davy and Liebig. In respect to the department of Physical Geography, I am much indebted to the Foreign Correspondence of the Athenæum.

Many of the facts I was enabled to collect or verify by personal observation during a journey through France, Italy, and Switzerland. Some of the chemical phenomena have also been derived from direct experiment. It is very probable that a few of the temperatures, in each department, will be found to differ from those given in some works on

Chemistry; and, on this point, I have one remark to make, namely, that the greatest discrepancies will often be found among respectable authorities in regard to temperature. It is impossible here to enter into the causes of these discrepancies. I have invariably acted on the principle of selecting the best authorities; and where these differed, I have endeavoured to arrive at an approximation to the truth by experiment, or where this was impossible, by seeking for corroborative circumstances. A large number of observations, made by travellers, I have been obliged to reject,—in some instances, owing to the omission or confusion of the + and — signs; and in others, owing to the observers having omitted to state what thermometers they employed. During the researches into which the compilation of this table has led me—occupying as it has done the occasional leisure of four years—my mind has been strongly impressed with the benefits which would accrue to science, if the philosophers of Europe would agree to employ only one scale, with small degrees and so adjusted as to render entirely unnecessary, the use of the + and — signs.

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Cambridge Place,
Regents Park.
January 6, 1845.

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Chemical and Physiological,

Connected with Temperature.

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CENTIGRADE	REAUMUR	FAHRENHEIT
Chlor. Cyanogen vol.d 190		pr. steam 12 at.
		372 Zinc pulverizable
Tin and Lead p.e m. also Alloy 1 T. 4 L. (Plumbers Solder)		
Sat.d Sol.n Chloride Zinc boils	150	
Alloy 4 T. 1 L. m.		Arsenious Acid vol.d Salicylous A.d b
		Dichlor. Carbon b. d. v. 4.7. pr. steam 11 at.
		Fulmin.g Mercury explodes
		Alloy 15 T. 4 L. m.
Oxalic Ether b. 1.09		362
Sulph.c A.d 1.67 boils		Alloy 14 T. 4 L. m.
pr. steam 10 at.		Elast.y Turp. V. 60.8
		Alloy 13 T. 4 L. m.
Paranaphthaline m. Alloy 12 T. 4 L. melts	130	Ars.s vol.d Sugar melts. Hydruret of Benzule m.
Oil of Oranges b. 0.835		Succinic A.d melts
Starch converted to Dextrine		Alloy 8 B. 32 L. 24 T. m. Citrilene b. 0.88.
pr. steam 9 at.		332
Elast.y Turp. v. 53.8. Sulphuric A.d 1.85 boils		Alloys 5 T. 4 L. and 11 T. 4 L. m.
		Sulphury. Solid. Iodine boils d. v. 8.69.
		Malic A.d m.
Alloy 10 T. 4 L. m.	120	Alloy 8 B. 32 L. 26 T. m.
		Oil of Lemons boils 0.848
Alloy 9 T. 4 L. m.		Oil of Cascarilla b. 0.936.
pr. steam 8 at.		Alloy 8 B. 30 L. 24 T. m.
		302
Alloy 8 T. 4 L. m.		Caoutchoucine boils
Alloy 7 T. 4 L. m.	110	Elast.y Turp. V. 47.3
pr. steam 7.5 at.		Sat.d Acet. Potash boils. Eupion b.
Alloy 1 B. 2 T. m.		Alloy 6 T. 4 L. m.
		332
pr. steam 7 at.		Alloy 8 B. 32 L. 28 T. m.
Alloy 8 B. 28 L. 24 T. m.		Oxalic Acid vol.d Elast.y Turp. V. 42.1
Oil Elemi b. 0.852		Alloy 8 B. 32 L. 30 T. m.
pr. steam 6.5 at.		
		Alloy 8 B. 32 L. 40 T. m.
Elast.y A.V. 137.28		382 Alloy 8 B. 32 L. 36 T. m.
pr. steam 6 at. Fusible. Alloy 8 B. 32 L. 30 T. m.	100	Naphtha boils. Alloy 8 B. 26 L. 24 T. m.
Alloy 8 B. 32 L. 34 T. m.		also 8 B. 32 L. 32 T.
Elast.y A.V. 131.57. Fulminating Silver explodes		Prussian Blue decomposed
pr. steam 5.5 at.		Alloy 8 B. 16 L. 24 T. m.
		Oil of Turpentine boils 0.86. dens. V. 4.7
Elast.y A.V. 125.55.		312 Alloy 8 B. 16 L. 22 T. m.
Elast.y Turp. v. 33.5.		Quinine m.
pr. steam 5 at.		Alloy 8 B. 20 L. 24 T. m. Oil Juniper b.
Elast.y A.V. 120.03.		Alloy 8 B. 22 L. 24 T. m.
		Rect.d Petroleum b.
Elast.y Turp. v. 30. Sat.d Nit. Lime boils		Carb. Pot. Sat.d boils { Alloys 8 B. 16 L. 40 T. and 8 B. 16 L. 26 T. m.
Sulphur burns feebly		
Elast.y A.V. 114.15	150	302 ETHERIFICATION ends. Latent heat. Ether Vap.r
Terbromide Silicon b.		
4 pts. S.r A.d & 1 pt. Water mixed pr. steam 4.5 at.		Alloy 8 B. 16 L. 8 T. m. Camphilene b. 86.
Mastich resin m.		[Sugar of Milk m.
Alloy 8 B. 16 L. 18 T. m.		
El.y A.V. 108.31. Temp.s of certain Factories		Asphaltum melts. Camphor melts d. v. 5.31.
Nicotine distils		Zinc malleable
pr. steam 4 at.		
		Alloy 8 B. 16 L. 12 T. m.
Elast.y A.V. 102.45		292 Alloy 8 B. 16 L. 16 T. m.
Fulminating Gold explodes		Gypsum converted to Plaster.
Alloy 8 B. 16 L. 14 T. m.		Sulph.c A.d 1.32 b.
		Elast.y A.V. 96.64
pr. steam 3.5 at.		
Chlor. Cyanogen m. 861.32	140	Tin & Bismuth p. e. melt. Succ.c Acid vol.d
Grape sugar to caramel		pr. steam locomotive boilers.
Elast.y A.V. 90.99		282 ETHERIFICATION begins
		Cholesterine melts
Sat. Nit. Ammonia boils		Elast.y A.V. 85.47.
pr. steam 3 at.		Oil Black Mustard b. Malic A.d m.
Pimelic A.d m. Elast.y A.V. 79.34		Paroyl b. 0.86.
Chloride Benzole m.		272
		Syrup sat.d boils
		Corrosive Sublimate vol.d
Phloridzine Solid. Alloy 8 B. 10 L. 8 T. m.	130	Elast.y A.V. 74.79.
Camphoric A.d v.		Margaric A.d Castor Oil m.
pr. steam 2.5 at.		Elast.y Alch.l V. 166.1.
Elast.y A.V. 69.72		Syrup boils 88 per Cent Sugar
		262 Sat.d Tartrate Potass boils
Sebacic A.d m. El.y Alch.l v. 55.2		Sat. Nitrate Potass boils. Heat borne by Gr. J. Banks [and D. Blagden.
Sat. Mur. Ammonia boils	100	Hydriodic Acid boils 1.7, also Hydrobrom.c A.d 1.5
		Elast.y A.V. 64.82. Pimaric A.d m.
Sat. Acet. Soda boils		
Pyromeconic A.d m.		Alloy 8 B. 8 L. 6 T. m.
Elast.y A.V. 61.05		232 Nitric Acid 1.42 boils
pr. steam 2 at.		
Sat.d Nit. Soda boils		Elast.y Alch.l V. 132.3. Dichl. Carbon v.
Cinnamic A.d m. Caoutchouc melts	120	Benzine melts. Hyd. Acet.c Acid boils (Turner)
Alloy 5 B. 1 L. 4 T. m.		Elast.y A.V. 65.54.
		Heavy Muriatic Ether b.
Sat.d Chlor. Strone.m boils		Elast.y Alch.l V. 118.2
Elast.y A.V. 51.34		242 Alloy 8 B. 8 L. 6 T. m.
Syrup b. 86 per cent. Chlor. Calcium. Sat. boils		Sulph.c A.d 1.30. b. Pyrogallic A.d m.
		Veratrine & Benzamide m.
Elast.y A.V. 47.2		Accumulated temp. of Air EDINBURGH.
Alloy 8 B. 8 L. 4 T. m.		Acet.c Acid 1.063 boils. Nit.c Acid 1.36 b.
Chloric Ether 1.227 boils pr. steam 1.5 at.	90	Syrup boils 82 per cent Sugar
Elast.y A.V. 43.24		232
Elaïne b. Elast.y Alch.l v. 94.1	110	Sulphur melts d. v. 6.65. Benzoine m.
Phloridzine m.		Benzoic Acid melts d. v. 4.27
Elast.y A.V. 40.58		Salicine m.
Alloy 8 B. 8 L. 4 T. m.		Zinc malleable. Heat borne by Delaroche.
Oxalhydric A.d b 1.375		Sat.d Chlor. Sod.m boils
Water of the Dead Sea boils		Sat.d Chlor. Pot.m boils
Sat.d Carb. Soda. Chlor. Barium & Chlorate Potash b.		
Salicine m. Nitric Acid 1.46 b.		Sat.d Phosph. Soda boils
		222 Muriatic A.d 1.047 b. Elast.y A.V. 36.25
Mur.c Acid 1.136 b.		Accumulated temp. of Air GENEVA
Syrup boils 52 per cent Sugar		Asphaltum melts. Iodine melts. Elast.y Ether V. 24.0.
Chlor.e Alum.a boils. Water boils Bar. 31 213.76		
Glauber Salt Sat. boils		Elast.y A.V. 33.09 inches Merc.y Grape Sugar m.
cc Ice & Sulph.c A.d pr. steam 1 at.	100	Oxalic Acid vol.d.
100 Air at 32°–137.5 Elast.y A.V. 30.66 [6.625]		Sylvic A.d m.
	212	Water boils 1054 ft. deg.s Selenium melts. Water b. bar. 31
Water boils Bar.r 30		Water boils 328 deep.s W.B. DEAD SEA and SEA of [TIBERIAS
Perox. Chlor. explodes		Water boils Bar.r 30
W.B. MADRID		Water boils 531 ft. Elevation
W.B. EL HATTAR (between Dead Sea and Akabah)		Water boils 1064 ft. Elev.n Cumic Acid melts
		Water boils 1600 ft. Elev.n Reikiavik spr.
COMAGILLAS Mexican Springs		Water boils 2138 ft. Elev.n
		Water boils 2678 ft. Elev.n Alloy 8 B. 6 L. 3 T. m.
W.B. CAVARNIE PYRENEES		Water boils 3221 ft. Elev.n
Volcanic mud. JORULLO, S. AMERICA		Water boils 3766 ft. Elev.n
Oxychloreca.c boric Ether b.		Water boils 4313 ft. Elev.n
Elast.y Ether vap.r 166. Elast.y A.V. 23.64		Water boils 4863 ft. Elev.n
W.B. MEXICO		Water boils 5415 ft. Elev.n
7471 ft. el.		202 Fusible metal. 8 B. 8 L. 3 T. m. Chloral b. d. v. 5.
		Elast.y Alch.l Vap.r 53.
W.B. SANTA FE DE BOGOTA		W.B. St. Gothard 6301 ft. Elev.n
8731 ft. el.	80	
Water boils CONVENT St. BERNARD		W.B. Mt. William AUSTRALIA 5200 ft. el.
9754 ft. el.		Water boils at Quito 9541 ft. Elev.n
		Sodium melts. Trinchera Springs S. AMER.a
		192 Water boils Summit of Etna 10353 ft. El.n

W.B. FARM of ANTISANA Andes 13400 ft. el.	192	Elast.y Ether vap.r 124.3 Alch.l vap.r 43.7
Chloric Ether b. 124		Alcohol b. 0.967 25 pr. cent.
W.B. Source of Oxus CENT.l ASIA (3600 feet elev.n)		Nitric Acid 1522 boils. Alcohol b. 0.938 30 pr. c.
		Ozokerite m.
Elast.y A.V. 15.16	182	Water boils Mont Blanc Summit 15630 ft. el.
Geyser Springs, Iceland.		San Germano bath NAPLES
Elast.y A.V. 14.2		Starch dissolves. Alch.l b. 0.870. 11 pr. c.
Heat of Fluid.y Bees wax		AIX LA CHAPELLE spr. max t.
Elast.y Alch.l vap. 30 in. S.G. 0.813		Latent heat Petroleum Vap.r also Oil Turp.
	50	Alcohol boils 0.825 85 pr. c.
Pitch melts		Thermal Spr. 1.e LUCON
		Alcohol boils 0.794 also 0.812 94 pr. c. to 100.
Vapour bath FINLAND max t.	172	Naphthaline melts
Perchlor. Carbon vap.d 1.55		Elast.y Ether vap. 92.8. Alch.l b. 92 pr. c. 0.817
		Elast.y A.V. 11.5.
Helenine m.		Phos.s burns violently. Acetic Ether b.
Elast.s A.V. 9.46. Ether vap.r 30.3		Oil of Cedar melts Carlsbad Spa
Starch converted to Sugar		Elast.y A.V. 10.4
	162	Heat of Fluid.y Lead
Baden Baden		Albumen coagul.s. Acetic Ether boils Pisciarelli [Springs NAPLES
Springs max. t.	70	Kochbrunnen, Wisbaden
		Stearic Acid melts
CALPEE, INDIES max t.		Elast.y A.V. 8.4
BAGNÈRES DE LUCHON spr.		STEAM BOATS ENGINE ROOM, W. INDIES
Elast.y A.V. 7.42 S.G. 0.17. Ether vap.r 67.6		HECLA EARTH AT SUMMIT
	152	Thermal Spr. TAJURAH & SHOA
Albumen opaline		White Wine melts, Pyrox.e Spirit boils
Elast.y A.V. 6.87		Wiesbaden Spa Hydried.c Ether b. S.G. 1.32
Heat of Fluid.y Spermaceti		Plombières Spr.
Heat of Fluid.y Sulphur		
Vapour bath RUSSIA		Ambergris m.
Chloroform b. d. v. 4.2		Ischia Springs NAPLES. Leuker Spr. 5000 ft. el.
* 3 A.d (15.58 pts. Water 12 pts. Front 60°	60	Aix-la-Chapelle Spa
	142	Yellow Wax melts
Mariana Springs S. AMER.a		Ammonia 0.94 boils. Pyroxylic Sp.t b. 0.835
Elast.y Ether vap.r 51.9		Elast.y A.V. 5.74
		Muriatic A.d 1.19 boils
BARBARY max. t.		UPPER EGYPT in a tent. Aetas Spr.
Abietic A.d m.		Elast.y A.V. 5.14
Ammonia 0.936 b.		Margaric Acid melts
Elast.y A.V. 4.2		Formic Ether b. S.G. 915
OASIS or MOORZOUK max. t.	132	Acetone boils (Pyroacetic Spirit)
FEZZAN AFRICA max. t.		Oliene b.
		Potassium melts Vapor Bath ends
Terchlor. Silicon b.		Berger in Vapeur bath 12 min.
BAGNÈRES DE BIGORRE spr.		Jorulle Springs S. AMER.a MYNPOOREE max t.
Amalgam 8 B. 3 L. 3 T. and 3 Mercury m.	50	Sands at St Fernando S. AMER.a Air 101°
Concent.d Sulph.c A.d evaporates		Stearic & Oleic A.ds mixed melt. BELBEIS EGYPT
		Mutton Suet melts. Cauterets Spr.
Palmitic A.d m.		Rotakekaumene Spr.
Hamman Ali Springs BARBARY		122 Styracine m.
PAMPAS S.th AMER.a		
		Stearine & Cetine melt. Myristic A.d m. Elast.y A.V. 3.33.
CENTRAL AFRICA s.t BASSORA max t.		Palmitic A.d m.
PONDICHERRY max t.		Bath Springs max t. Supposed depth 3256 ft. Lark
Chloronaphthalese m.		Bromine boils. Hot Pump at Bath dens.y Br. V. 5.54
	112	Spermaceti melts. Muscat Springs
PHILOE EGYPT, CAPE of GOOD HOPE max t.		*Duck *Guinea Fowl *Raven
Myrtle wax m.		*Pigeon PEKIN max t. Vichy Spr. max t.
SENEGAL s.t.		C. Fowl. Cross Bath at BATH
BARÈGE spr.		*Birds 108° 111°
MADRAS. CAIRO max t.	40	Sulph.c Carbon boils
Gurnarlok Spring GREENLAND		Cold bleeded animals die
GUADALOUPE max t.		Temp. for Incubation. Elast.y Ether Vap.r 30 inches
PARIS 1783 EQUATOR max t.		*Sheep & Pig. Oil. Phosphorus melts.
Eupion b. 0.65		*Ape. Dog. Goat. Arter. incub.r
GUANAXUATO MINES 1700 ft. deep		102 *Animals, Man max. t. Ox. Infant Child
7000 ft. el.		*Squirrel. Rat. Cat. Jackal. Panther
MEXICAN MINES max t.		*Rat. Hare. Tiger. Horse. Elephant Elast.y A.V. 1.86.
STRASBURG, VIENNA max t.		Warm bath ends. Vapor bath commences
Plan min t.		*Temp. Man. Kite (Birds)
TEXAS s.t.		Bleed Heat. Hedgehog. Dormouse
MARTINIQUE max t.		Topid Bath ends Warm Bath begins
STOCKHOLM max t.		Ether boils 0.724. dens. V. 2.55
Consel Mines CORNWALL 1140 ft.		Oil of Roses melts. Cetene A.d m.
COPENHAGEN, WARSAW max t.		FUTREFACTION rapid
EAUX BONNES Pyrenees	92	Old Palm oil m.
		VALENCIANA MINE MEXICO Grenelle well 1794 ft.
max t. of SURINAM		Elast.y A.V. 1.36. Poldice mine
ROCHAT spr.		Tallow melts
CAIRO s.t.		ACETOUS FERMENTATION
	30	PETERSBURG max t. Oil nutmegs m.
IS MALTA, EGYPT m.s.t.		Kessareyeh ASIA MINOR 4200 ft. el.
PONDICHERRY m.t.		Tepid Bath begins. Cacao butter m.
Seychelles max t. Schlangenbad Spa		*Tortoise, Cornish Mines, Buxton Spa. CALCOLES MMC
CUMANA m.t.		*Serpents SEA EQUATOR 83.7. 1425 ft.
BRAZILS m.t. BARBARY m.s.t.	82	Nit.c Acid 1.42 boils. Buxton Bath ALGIERS s.t.
CEYLON, SENEGAL, BATAVIA m.t.		EQUATOR m.t. 81.5. *Oyster, Snail. Tropics)
MADRAS m.t.		Phosphorus luminous in pure Oxygen. NAPLES s.t.
CONGO, MANILLA, BERMUDES, HAVANNAH m.t.		Prussic Acid boils 0.68 (El.y A.V. 1)
BOMBAY m.t. ITALY m.s.t.		*Frog, Shark, Flying fish, Scorpion (Tropics)
Date tree. VERA CRUZ		*Insects, Silk Worms hatched. Germination.
Aries.n Well. BRAZILS, JAMAICA m.t.		Bristol Spa. temp.e Wasp
(200 ft.) RIO JANEIRO m.t.		MEXICAN MINES 1650 ft. deep SYDNEY s.t.
CANTON, MACAO m.t.		*Glow worm. Crickes PRUSSIAN MINES 850 ft.
BAGDAD m.t.		Artesian Well CRENELLE 1800 ft. deep
Aldehyde L. CARACCAS, CAIRO m.t.	72	MONKWEARMOUTH MINE 1500 ft. deep
SANTA CRUZ, TENERIFFE		Water boils in vacuo. *Crab.
Hyper.c Ether I. Iodine vaporised		VINOUS FERMENTATION. Butyric acids. CAIRO WELL
Elast.y A.V. 0.721		DURHAM COAL MINES 900 ft. (240 ft. deep.)
Cotton tree. ALGIERS m.t.		Cocoa Nut Oil Liquid. Matlock Bath. Grotte del Cane
Gipps, land AUSTRALIA. MALTA m.t.	20	CORDILLERAS ANDES m.t. 5000 ft. el.
CAPE or GOOD HOPE, FUNCHAL m.t.		Matlock Springs. CUMBERLAND COAL MINES 600 ft.
Elast.y A.V. 0.616		STRON MINES 1246 ft. Bakewell Spr.
Cultivation of Vine ends		MADEIRA m.w.t. Air centre of all Waters of the Scalsan
ENGLAND m.s.t. 52.0		(NAPLES m.t. Temp. for Sick Rooms.
TOULON m.t.		62 DEEP MINES, EUROPE. Sea Bank of Aguillas
Elast.y A.V. 0.52. ROME, NICE m.t.		PARAMATTA, N.S.W. m.t. ALGIERS w.t. Sea Azores
MELVILLE I. NISMES, GENOA, LUCCA m.t.		Fluoric Acid boils Anhy.s Chlorine liq.d 4 at
(max. t.) PERPIGNAN, MONTPELIER m.t.		Acetic Acid cryst. Dry at 44m.e 3600 ft.
Waterford Mines 714 ft. deep.m MARSEILLES m.t.		CAIRO w.t. MINES of BRITTANY 500 ft. BERGEN s.t.
LISBON, BOLOGNA, BORDEAUX, AIX, VENICE m.t.		*Trout. MEDITERRANEAN SEA 2000 ft. deep
LYONS, VERONA, MILAN m.t.		Vaucluse Fountain 360 ft. d.
PAU m.t. LOWER EGYPT w.t.		Artesian Well VIENNA 200 ft. Banwell 230 ft.
AMSTERDAM, PEKIN, NEW YORK m.t.		Camphor fleats. Elast.y A.V. 0.44.
m.t. NANTES, St. MALO		PIC DU MIDI 9500 ft. JERSEY m.t.
MALTA w.t. m.t. BRUSSELS	52	Oil of Aniseed solid. Muriatic Ether boils
PENZANCE m.t.		CLERMONT m.t. Columbia m.t.
Cultivation of Vine begins. PARIS, LONDON m.t.		ITALY m.w.t. VIENNA m.t. 50.5 FUTREFACTION begins
Elast.y A.V. 0.37. 3.0. 0.7	10	Liq. Ammon. boils. Sul. at 32, STRASBURG m.t.
Salt Mines CRACOW 130 feet, Muriatic A.d 40 at Liq.d		WARSAW BERNE m.t. [PRAGUE, GENEVA m.t.
Sulphur.c Hyd.n 15 at. Ammonia 6.5 at		TENERIFFE PEAK 12078 ft. el.
EDINBURGH, BERLIN, DUBLIN m.t.		ZURICH, GUTTINGEN, LABRADOR s.t.
		Sulphur.ic Acid liq.d 32 at. Pruss. Nit. 50 at. Cyanogen
INVERNESS, COPENHAGEN m.t.		SEA EQUATOR 2400 ft. deep 3.6 at.
COVE CORK w.t. m.t. TORONTO		DEEP SEA Common Springs, HASTINGS w.t.
MONT PERDU, PYRENEES	42	LAKE of GENEVA 1000 ft. deep, ROME w.t.
11263 ft. el.		LAKE LUCERNE 636 ft. deep *Beetle. PAU w.t.
UPSAL, STOCKHOLM, QUEBEC m.t.		St. A.d 178 Sugar CARPATH.n MOUNTS Mercury evap.d
Elast.y A.V. 0.761 CANADA m.t.		CAPE HORN SURFACE of SEA. max. density of Water
CHRISTIANIA, DRONTHEIM m.t.		EDINBURGH w.t.
Hybernation of animals		ENGLAND m.w.t. 37.8
PETERSBURG m.t. Etna Sum.t		Alcohol boils in vacuo. NOVA ZEMBLA s.t. SHETLAND w.t.
KASAN m.t. 10.855 ft. el.		Fixed Oils fr. 32. SOUTH SEA 12420 ft. deep
POLAR SEAS 360 ft. deep		CAPE HORN SEA 3468 ft. deep
BERGEN, PADUA, COLUMBIA T.w.t.		Mount Argæus ASIA MINOR 10300 ft. el.
MOSCOW m.t. Oils freeze	32	Ether Wt. fr. S.t A.d 3.rd Hydr. freezes
ALTEN, NORWAY m.t.		POLAR SEA 2300 ft. deep. Earth YAKUTSK 382 ft. deep
(Carb.c Acid Liq.d 36 at) LIM, CAPE, LAPLAND, LABRADOR		Milk freezes
Elast.y A.V. 0.2 inches 30.005	0	CARTHAGENA, SPAIN w.t.
CUMBERLAND HO. N.A. m.t.		Sals Wt. fr. 1.026, Vinegar freezes. Formic A.d fr.
Earth YAKUTSK 330 to 382 ft. deep.m		Earth YAKUTSK 217 ft. deep
CHIMBORAZO		JUNGFRAU Summit 12713 ft.
19600 ft. el.		Blood freezes. Earth YAKUTSK 118 ft. deep
HIMALAYAS 18000 ft. el. MONT BLANC		Elain fr.s HECLA Air at Summit 516 ft. el.
15641 ft.		Oil Bergamot freezes
IRKUTSK m.t.		
	22	Oil Cinnamon freezes. Oleic A.d (Castor oil) fr.
SIBERIA m.t.		Wine freezes
Earth YAKUTSK 77 ft. deep.m		Earth YAKUTSK 60 ft. deep.m
		GULF BOTHNIA AIR m.w.t. Ct. Bear Lake m.t.
AIR m.t. POLAR SEA		AIR 23000 feet elevation above PARIS
NOVA ZEMBLA m.t. PORT ENTERPRIZE w.t.		(at Surface 87°)
Anhyd.s Sulphurous Acid boils	10	Salt Water freez.s 1.104
Oil of Turpentine freezes		RUSSIA m.w.t.
	12	
		Prussic Acid cryst.d 0.68 S.G.
		ALTEN NORWAY w.t.
		N. POLE m.t. 13. below Zero scale.d
		Mercury freezes } 40° below Zero in W.t. at.
		Ether boils in vacuo } NOVA ZEMBLA & YAKUTSK
		Carb.c Acid freezes 144° below Zero
		Lowest artificial Cold 147° below Zero

Lowest nat.l temperature at YAKUTSK in Siberia – 72 – 84° below this Scale

CENTIGRADE TO FAHRENHEIT

Above Ice	Between Ice and Zero
C × 1.8 +32	32 – (C × 1.8)
Below Zero	
C × 1.8 – 32	

FAHRENHEIT TO CENTIGRADE

Above Ice.	Between Ice and Zero
$\frac{F-32}{1.8}$	$\frac{32-F}{1.8}$
Below Zero.	
$\frac{F+32}{1.8}$	

ABBREVIATIONS.

m. melts. *m.t* mean temperature. *w* winter. *s* summer. *at* atmosphere. *b* boils. *v* volatilized. *liq.d* liquid. *liq.d* liquefied. *A.d* Acid. *max* maximum. *min* minimum. *Sol.* solution. *W.B* Water boils. *el* elevation. In reference to fusible Alloys: *B.* Bismuth. *T* Tin. *L* Lead. *pr* pressure. *dep.* depression. *I* Island. *Vap.r* Vapour. *Elast.y* Elasticity. *Fluid.y* Fluidity. *Alch.l* Alcohol. *Turp.* Turpentine. *dens.* density. — In regard to places mean temp.e is implied where not expressly stated. *r* river. *spr* spring. *fr* freezes. *A.V* Aqueous vapour. *d.v.* density of vapour. *S.G.* specific gravity. The Elasticity of Vapours is given in inches of Mercury.

TEMPERATURES ABOVE THE SCALE.

Tin and Cadmium m. 442°. Tempered Steel (straw color) 460°. Sil.r A.d 178 b. 467°. Bismuth m. 476. Temp.d Steel (brown) 500°. Fixed Oils b. 530°. Temp.d Steel (red and purple) 550. The same (blue) 600°. Lead m. 612°. Sil.r A.d 1.85 b. 648°. Mercury b. 662°. Zinc m. 680°. Gunpowder explodes 700°. Antimony m. 810°. Red heat 980. Flint glass m. 1000°. Heat of common fire 1141°. Brass m. 1869°. Silver m. 1873°. Copper m. 1996°. Gold 2016°. Cast Iron 2786°. Pure Iron and Platina m. 2380°. Wind Furnace White heat 3300°.

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